

Claims

1. A stereoscopic video encoding apparatus that supports multi-display modes based on a user display
5 information, comprising:

a field separating means for separating right and left-eye input images into an odd field of the left-eye image (LO), even field of the left-eye image (LE), odd
10 field of the right-eye image (RO), and even field of the right-eye image (RE);

an encoding means for encoding the fields separated in the field separating means by performing motion and disparity compensation; and

a multiplexing means for multiplexing the essential
15 fields among the fields received from the encoding means, based on the user display information.

2. The stereoscopic video encoding apparatus as recited in claim 1, wherein the encoding means forms the
20 main layer with the odd field of the left-eye image (LO) and the even field of the right-eye image (RE), a first sub-layer with the even field of the left-eye image (LE), and a second sub-layer with the odd field of the right-eye image (RO).

25 3. The stereoscopic video encoding apparatus as recited in claim 2, wherein the encoding means forms the base layer of the main layer with the odd field of the left-eye image (LO) and forms the enhancement layer of the
30 main layer with the even field of the right-eye image (RE), and then performs encoding using estimation for motion and disparity compensation.

4. The stereoscopic video encoding apparatus as
35 recited in claim 2, wherein the first sub-layer performs the estimation for motion compensation based on the

information related to the base layer, and performs the estimation for disparity compensation based on the information related to the enhancement layer.

5 5. The stereoscopic video encoding apparatus as recited in claim 2, wherein the second sub-layer performs the estimation for disparity compensation based on the information related to the base layer, and performs the estimation for motion compensation based on the information
10 related to the enhancement layer.

6. The stereoscopic video encoding apparatus as recited in claim 1, wherein the encoding means forms the main layer with the odd field of the left-eye image (LO), a
15 first sub-layer with the even field of the right-eye image (RE), a second sub-layer with the even field of the left-eye image (LE), and a third sub-layer with the odd field of the right-eye image (RO).

20 7. The stereoscopic video encoding apparatus as recited in claim 6, wherein the main layer performs the estimation for motion compensation based on the information related to the main layer.

25 8. The stereoscopic video encoding apparatus as recited in claim 6, wherein the first sub-layer performs the estimation for motion compensation based on the information related to the first sub-layer, and performs the estimation for disparity compensation based on the
30 information related to the main layer.

9. The stereoscopic video encoding apparatus as recited in claim 6, wherein the second sub-layer performs the estimation for motion compensation based on the
35 information related to the main layer and the second sub-layer.

10. The stereoscopic video encoding apparatus as recited in claim 6, wherein the third sub-layer performs the estimation for motion compensation based on the information related to the first sub-layer, and performs the estimation for disparity compensation based on the information related to the main layer.

11. The stereoscopic video encoding apparatus as recited in claim 1, wherein the user display information includes a three-dimensional field shuttering display, a three-dimensional frame shuttering display, and a two-dimensional display.

12. The stereoscopic video encoding apparatus as recited in claim 1, wherein the multiplexing means multiplexes the odd field of the left-eye image (LO) and the even field of the right-eye image (RE), in case where the user display information indicates a three-dimensional field shuttering display.

13. The stereoscopic video encoding apparatus as recited in claim 1, wherein the multiplexing means multiplexes the odd field of the left-eye image (LO), the even field of the left-eye image (LE), the odd field of the right-eye image (RO), and the even field of the right-eye image (RE), in case where the user display information indicates a three-dimensional frame shuttering display.

14. The stereoscopic video encoding apparatus as recited in claim 1, wherein the multiplexing means multiplexes the odd field of the left-eye image (LO), and even field of the left-eye image (LE), in case where the user display information indicates a two-dimensional display.

15. A stereoscopic video decoding apparatus that supports multi-display modes based on a user display information, comprising:

an inverse-multiplexing means for multiplexing
5 supplied bit stream to be suitable for the user display information;

a decoding means for decoding the field inverse-multiplexed in the inverse-multiplexing means by performing estimation for motion and disparity compensation; and

10 a display means for displaying an image decoded in the decoding means based on the user display information.

16. The stereoscopic video decoding apparatus as recited in claim 15, wherein the user display information
15 includes a three-dimensional field shuttering display, a three-dimensional frame shuttering display, and a two-dimensional display.

17. The stereoscopic video decoding apparatus as recited in claim 15, wherein the inverse-multiplexing means
20 inverse-multiplexes the bit stream into the odd field of the left-eye image (LO) and the even field of the right-eye image (RE), in case where the user display mode indicates a three-dimensional field shuttering display.

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18. The stereoscopic video decoding apparatus as recited in claim 15, wherein the inverse-multiplexing means
inverse-multiplexes the bit stream into the odd field of the left-eye image (LO), even field of the left-eye image
30 (LE), odd field of the right-eye image (RO), and the even field of the right-eye image (RE), in case where the user display mode indicates a three-dimensional frame shuttering display.

35 19. The stereoscopic video decoding apparatus as recited in claim 15, wherein the inverse-multiplexing means

inverse-multiplexes the bit stream into the odd field of the left-eye image (LO), and even field of the left-eye image (LE), in case where the user display mode indicates a two-dimensional display.

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20. The stereoscopic video decoding apparatus as recited in claim 15, wherein the display means displays an image that is decoded from the odd field of the left-eye image (LO), and an image that is decoded from the even field of the right-eye image (RE) at predetermined time intervals, in case where the user display mode indicates a three-dimensional field shuttering display.

21. The stereoscopic video decoding apparatus as recited in claim 15, wherein the display means displays an image that is decoded from the odd field of the left-eye image (LO), an image decoded from the even field of the left-eye image (LE), an image decoded from the odd field of the right-eye image (RO), and an image decoded from the even field of the right-eye image (RE) at predetermined time intervals, in case where the user display mode indicates a three-dimensional frame shuttering display.

22. The stereoscopic video decoding apparatus as recited in claim 15, wherein the display means displays an image that is decoded from the odd field of the left-eye image (LO), and an image decoded from the even field of the left-eye image (LE) simultaneously, in case where the user display mode indicates a two-dimensional display.

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23. A method for encoding a stereoscopic video image that supports multi-display mode based on a user display information, comprising the steps of:

a) separating right and left-eye input images into an odd field of the left-eye image (LO), an even field of the left-eye image (LE), an odd field of the right-eye image

(RO), and an even field of the right-eye image (RE);

b) encoding the fields separated in the above step a) by performing estimation for motion and disparity compensation; and

5 c) multiplexing the essential fields among the fields encoded in the step b) based on the user display information.

24. A method for decoding a stereoscopic video image
10 that supports multi-display mode based on a user display information, comprising the steps of:

a) inverse-multiplexing supplied bit stream to be suitable for the user display information;

b) decoding the fields inverse-multiplexed in the step
15 a) by performing estimation for motion and disparity compensation; and

c) displaying an image decoded in the step b) according to the user display information.

20 25. A computer-readable recording medium provided with a microprocessor for recording a program that implements a stereoscopic video encoding method supporting multi-display modes based on a user display information, comprising the steps of:

25 a) separating right and left-eye input images into an odd field of the left-eye image(LO), an even field of the left-eye image (LE), an odd field of the right-eye image(RO), and an even field of the right-eye image (RE);

b) encoding the fields separated in the above step a)
30 by performing estimation for motion and disparity compensation; and

c) multiplexing the essential fields among the fields encoded in the step b) based on the user display information.

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26. A computer-readable recording medium provided with

a microprocessor for recording a program that implements a stereoscopic video decoding method supporting multi-display modes based on a user display information, comprising the steps of:

- 5 a) inverse-multiplexing supplied bit stream to be suitable for the user display information;
- b) decoding the fields inverse-multiplexed in the step a) by performing estimation for motion and disparity compensation; and
- 10 c) displaying an image decoded in the step b) according to the user display information.